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901 New York Avenue N W
Washington, DC 20001-4413

EXAMINER

CHOW, CHARLES CHIANG

ART UNIT	PAPER NUMBER
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2618

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/563,286	Applicant(s) MELE ET AL.	
	Examiner CHARLES CHOW	Art Unit 2618	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 October 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-50 is/are pending in the application.
- 4a) Of the above claim(s) 1-25,27 and 46-49 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 26, 28-45,50 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date. _____ | 6) <input type="checkbox"/> Other: _____ |

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Detailed Action

1. For argued limitations in amendment 10/27/2010, referring to the last pages of this office action. Applicant has canceled claims 27, 46-49.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 26, 28, 31-33, 40, 46-50 are rejected under 35 U.S.C. 103(a) as being unpatentable over Laubacher et al. [US 6,688,127] in view of Abdelmonem et al. [US 6,622,028].

For claim 26, Laubacher et al. [Laubacher] discloses a receiver front-end [Fig.6B/Fig. 6A & their description] for use in a transceiver station of a wireless communication network [base station in wireless network, col. 15, lined 47 to col. 16, line 28],

said transceiver station being associated with an antenna assembly comprising a primary and at least a secondary antenna [antenna assembly has main antenna 610 & diversity antenna 605, Fig. 6B/col. 15, lines 42-66],

said receiver front-end [630/680, Fig. 6B; front end 205] being adapted for insertion between said antenna assembly [610/605] and signal processing sections of said transceiver station [the front 205 is followed by active-circuit 210 which has combination of amplifier, mixer, analog-to-digital converters, digital processor, col. 14, line 57 to col. 15, line 11],

said receiver front-end comprising a primary and at least a secondary receiving branch [main branch for antenna 610/cryogenic unit 630 and second branch for antenna 605/cryogenic unit 680 in Fig. 6B, col. 15, lined 47 to col. 16, line 28],

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said primary receiving branch [610/630] being adapted for coupling to said primary antenna [610] and to said signal processing sections of said transceiver station [such as active 210 in col. 14, line 57 to col. 15, line 11] and

said secondary receiving branch [605/680] being adapted for coupling to said secondary antenna [605] and to said signal processing sections [such as active 210 col. 14, line 57 to col. 15, line 11];

said secondary receiving branch comprising at least a superconducting component.

[the high temperature superconductor HTS filter 645 in the second branch 680, Fig. 6B, col. 16, lines 3-18].

Laubacher fails to teach the non-superconducting components.

Abdelmonem et al. [Abdelmonem] also discloses said secondary receiving branch [path of input 58 to output 62, Fig. 6] comprising at least one superconducting component [high temperature superconducting HTS filter 58 structured in Fig. 6/Fig. 2-5], and the wherein said primary receiving branch [path of input of 60 to output of 258] consists of non-superconducting components including at least one non-superconducting filter, normal filter 60

[the switching of receiving path to path with superconducting HTS filter or to path with normal filter, description of Fig. 2-6 for of rf front-end of the cellular base station, co. 1, lines 14-26; Fig. 4/col. 8, lines 23-48, any non-HTS band pass filter can be used for filter 60, for better signal rejection, noise floor in col. 6, lines 42-53], such that the filtered signal rejection, noise floor, can be better. Therefore, one of ordinary skill in the art at the time the invention was made would have been obvious to improve Laubacher with Abdelmonem's teachings above, such that the signal reject, noise floor, would be better.

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For claim 28, Laubacher teaches the wherein said superconducting component comprises a low-loss filter obtained with a technology based on high critical temperature superconducting materials [the HTS filter provides extremely low in-band insertion loss, col. 1, lines 53-59].

For claim 31, Laubacher fails to teach the non-cryogenic.

Abdelmonem teaches the wherein said primary receiving branch comprises a non-superconducting receiving filter and a non-cryogenic, low-noise amplifier mutually connected in cascade arrangement [the normal conventional non-HTS filter 60 & LNA 154, structure in Fig. 4]. Therefore, one of ordinary skill in the art at the time the invention was made would have been obvious to improve Laubacher with Abdelmonem's teachings above, such that the noise figure would be better, based on the selected filter.

For claim 32, Laubacher teaches the wherein said primary receiving branch comprises a non-superconducting receiving filter and a cryogenic, low-noise amplifier mutually connected in cascade arrangement [non-superconducting receiving filter 675 and cryogenic 640, structured in Fig. 61A].

For claim 33, Laubacher teaches the wherein said low-loss filter [635/Fig. 6A], said cryogenic, low-noise amplifier [640] of said primary receiving branch and said cryogenic, low-noise amplifier [650] of said secondary receiving branch are enclosed in a cryogenic refrigerator unit [630, description of Fig. 6A].

For claim 50, Laubacher discloses a transceiver station of a wireless communication network [base station in wireless network, col. 15, lined 47 to col. 16, line 28],

said transceiver station being associated with an antenna assembly comprising a primary and at least a secondary antenna [antenna assembly has main antenna 610 & diversity antenna 605, Fig. 6B/col. 15, lines 42-66], comprising

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a receiver front-end [630/680, Fig. 6B; front end 205] being adapted for insertion between said antenna assembly [610/605] and signal processing sections of said transceiver station [the front 205 is followed by active-circuit 210 which has combination of amplifier, mixer, analog-to-digital converters, digital processor, col. 14, line 57 to col. 15, line 11],

said receiver front-end comprising a primary and at least a secondary receiving branch [main branch for antenna 610/cryogenic unit 630 and second branch for antenna 605/cryogenic unit 680 in Fig. 6B, col. 15, lined 47 to col. 16, line 28],

said primary receiving branch [610/630] being adapted for coupling to said primary antenna [610] and to said signal processing sections of said transceiver station [such as active 210 in col. 14, line 57 to col. 15, line 11] and

said secondary receiving branch [605/680] being adapted for coupling to said secondary antenna [605] and to said signal processing sections [such as active 210 col. 14, line 57 to col. 15, line 11];

said secondary receiving branch comprising at least one superconducting component.

[the high temperature superconductor HTS filter 645 in the second branch 680, Fig. 6B, col. 16, lines 3-18],

wherein said signal processing sections [active circuit 210] are coupled to said receiver front-end [the front 205 is followed by active-circuit 210 which has combination of amplifier, mixer, analog-to-digital converters, digital processor, col. 14, line 57 to col. 15, line 11; Eddy et al. US 2005/0026,588 also teaches the front ends 110 coupled to processor 500 having demodulator 504, A/D/down converter 502/504, parag. 0042/description of Fig. 4].

Laubacher fails to teach the non-superconducting components.

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Abdelmonem also discloses said secondary receiving branch [path of input 58 to output 62, Fig. 6] comprising at least one superconducting component [high temperature superconducting HTS filter 58 structured in Fig. 6/Fig. 2-5], and the

wherein said primary receiving branch [path of input of 60 to output of 258] consists of non-superconducting components including at least one non-superconducting filter, normal filter 60

[the switching of receiving path to path with superconducting HTS filter or to path with normal filter, description of Fig. 2-6 for of rf front-end of the cellular base station, co. 1, lines 14-26; Fig. 4/col. 8, lines 23-48, any non-HTS band pass filter can be used for filter 60, for better signal rejection, noise floor in col. 6, lines 42-53], such that the filtered signal rejection, noise floor, can be better. Therefore, one of ordinary skill in the art at the time the invention was made would have been obvious to improve Laubacher with Abdelmonem's technique above, such that the rejection of interfering signal & the noise floor could be better.

5. Claims 29-30, 34-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Laubacher in view of Abdelmonem-'028, as applied to claim 28 above, and further in view of Abdelmonem et al. [US 2002/0151,331].

For claim 29, Laubacher view of Abdelmonem-'028 fails to teach LNA connected to filter.

Abdelmonem et al. [Abdelmonem-331]The receiver front-end according to claim 28, wherein said secondary receiving branch comprises a cryogenic, low-noise amplifier LNA cascade connected to said low-loss filter [the LNA 54 connected to minimum loss filter 28 in

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different branches, cooled by 18, Fig. 2/parag. 0032-0033]. Therefore, one of ordinary skill in the art at the time the invention was made would have been obvious to improve Laubacher, Abdelmonem-'028 with Abdelmonem-331's teachings above, such that the LNA could be connected to a low loss filter.

For claim 30, Laubacher teaches the wherein said low-loss filter and said cryogenic, low-noise amplifier are both enclosed in a cryogenic refrigerator unit operating at cryogenic temperatures [the cryogenic unit 680 contains both low loss HTS filter 645 & LNA 650, col. 16, lines 19-28].

For claims 34-36, Laubacher teaches the wherein said cryogenic refrigerator unit operates at cryogenic temperatures lower than 250 K, lower than 100 K, higher than 60 K [the cooling temperature can be 80K, col. 9, lines 33-45].

6. Claims 37-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Laubacher in view of Abdelmonem-'028, as applied to claim 28 above, and further in view of Abdelmonem et al. [US 2003/0227,350].

For claims 37-39, Laubacher fails to teach the filter's noise figure.

Abdelmonem-'028 teaches the wherein said low-loss filter has a noise figure lower than 0.7 dB, lower than 0.5 dB [the HTS filter has noise filter less than 0.5 dB, col. 6, lines 34-41]; and Abdelmonem-'350 teaches the wherein said low-loss filter has a noise figure lower than 0.3 dB [the filter 100 can provide 0.2 dB insertion loss for the additive noise to noise figure, parag. 0030/Fig. 3], such that the filter's noise figure can be less than 0.3 dB.

Therefore, one of ordinary skill in the art at the time the invention was made would have been obvious to improve Laubacher, Abdelmonem-'028 with Abdelmonem-'350's teachings above, such that the filter's noise figure would be lower than 0.3 dB.

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7. Claims 41-42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Laubacher in view of Abdelmonem, as applied to claim 26 above, and further in view of Hey-Shipton [US 2005/0164,888].

For claims 41-42, Laubacher in view of Abdelmonem fails to teach the secondary transmission branch.

Hey-Shipton teaches the wherein said secondary receiving branch is connected in parallel to a secondary transmission branch, said secondary transmission branch comprising a transmitting filter; wherein said transmitting filter in said secondary transmission branch is obtained with a technology based on high critical temperature superconducting materials

[second receiving branch 925-n in parallel with secondary transmission branch in 920-n, description of Fig. 9/parag. 0067, having superconducting filter for each 920-n; superconducting filter 710 for transmitting side, Fig. 7, is the HTS filter, parag. 0065/0064], such that the filtered signal for transmitting can be better with the filter rejection. Therefore, one of ordinary skill in the art at the time the invention was made would have been obvious to improve Laubacher, Abdelmonem with Hey-Shipton's teachings above, such that the filtered signal for transmitting would be better with the filter rejection.

8. Claims 43-44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Laubacher in view of Abdelmonem, as applied to claim 26 above, and further in view of Patton et al. [US 6,263,215].

For claim 43-44, Laubacher in view of Abdelmonem fails to teach the loss due to distance to antenna, negligible with respect to the noise figure.

Patton et al. [Patton] teaches the wherein the receiver front-end is mounted at such a distance from said antenna assembly that losses due to antenna lead-in are negligible with respect to the noise figure introduced by said receiver front-end, wherein said distance is no greater than 3 meter, no greater than 1 meter

[the low loss cable 64 for connection from antenna to front end is less than 0.5 dB to minimize insertion loss, which is negligible to noise figure, col. 8, lines 16-38; the no more than 10 feet cable which is less than 3.05 meter, for the no greater than 3 meters, in col. 8, lines 16-27], such that the signal loss can be improved with low loss cable connection.

Therefore, one of ordinary skill in the art at the time the invention was made would have been obvious to improve Laubacher, Abdelmonem with Patton's teachings above, such that the signal loss would be improved with low loss cable connection.

9. Claim 45 is rejected under 35 U.S.C. 103(a) as being unpatentable over Laubacher in view of Abdelmonem, Patton, as applied to claim 44 above, and further in view of Jervis [US 6,011,524].

For claim 45, Laubacher, Abdelmonem, Patton fail to teach the one meter distance.

Jervis teaches the wherein said distance is no greater than 1 meter [the LNA is positioned no more distant than one meter from the antenna, col. 3, lines 52-65], such that the signal loss can be improved with shorter cable connection. Therefore, one of ordinary skill in the art at the time the invention was made would have been obvious to improve Laubacher, Abdelmonem, Patton with Jervis' teachings above, such that the signal loss would be improved with shorter cable connection.

Response to the Argument

10. Applicant's arguments filed 10/27/2010 have been fully considered but they are not persuasive.

Regarding **A>** said secondary receiving branch comprising at least one superconducting component, wherein said primary receiving branch consists of non-superconducting components including at least one non-superconducting filter, due to Abdelmonem [US 6622028] does not disclose a primary receiving branch consisting of non-superconducting components remains conductive during a fault in the cooling of a superconducting filter in a secondary receiving branch, see Spec. at 3, applicant's page 9pages 7-10 of amendment 10/27/2010],

Regarding the argued limitation, a primary receiving branch consisting of non-superconducting components remains conductive during a fault in the cooling of a superconducting filter in a secondary receiving branch, **this limitation is not included in the independent claims 26, 50, and**

previous **Abdelmonem [US 6622028]** does disclose limitations in **A>** above, said secondary receiving branch [path of input 58 to output 62, Fig. 6] comprising at least one superconducting component [High Temperature Superconducting HTS filter 58 structured in Fig. 6/Fig. 2-5], wherein said primary receiving branch [path of input of 60 to output of 258] consists of non-superconducting components including at least one non-superconducting filter, normal filter 60

[the switching of receiving path to the path with superconducting HTS filter or to the path with normal filter, description of Fig. 2-6 for the rf front-end of the cellular base station, co. 1, lines 14-26; Fig. 4/col. 8, lines 23-48,

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any non-HTS band pass filter can be used for filter 60, for better signal rejection, noise floor in col. 6, lines 42-53].

11. THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a). A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Conclusion

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Charles Chow whose telephone number is (571) 272-7889. The examiner can normally be reached on 8:00am-5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Duc Nguyen can be reached on (571) 272-7503. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system.

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Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Charles Chow/
Examiner, Art Unit 2618
December 10, 2010.

/Duc Nguyen/

Supervisory Patent Examiner, Art Unit 2618